IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4992
FUNKE *et al.*	Art Unit: 1616
Appl. No.: 10/581,348	Examiner: PAK, JOHN D.
§ 371(c) Date: April 6, 2007	Atty. Docket: 2400.0430000/RWE/PDL
For: **Active Compound Combinations Having Insecticidal Properties**	

Declaration of Heike Hungenberg Under 37 C.F.R. § 1.132

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

I, Heike Hungenberg, of Grünewaldstr. 39b, 40764 Langenfeld, Germany,

a citizen of Langenfeld, Germany, hereby declare:

1. That I am a biologist, having studied at the University of Giessen, Germany.

2. I am named as an inventor in U.S. Patent Application No. 10/581,348 ("the Application").

3. I am presently employed by Bayer CropScience AG, the assignee of above-captioned application.

4. That I currently hold the position of a scientist within the group of Product and Project Support, in which I supervise the biological tests of insecticides.

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5.   That I have read and understood the specification and claims of the
      Application.

6.   That compounds I-1-1, I-1-4, I-1-12, I-1-24, I-1-52, I-1-54, ethiprole and
      fipronil, described in the Application, were tested as described in Examples
      A-D, below.

7.   That Examples A-D were carried out under my supervision and control.

8.   That the expected efficacy of a given combination of two compounds is
      calculated as follows (see Colby, S.R., "Calculating Synergistic and
      antagonistic Responses of Herbicide Combinations," *Weeds 15*:20-22,
      1967):

If

X   is the efficacy expressed in % mortality of the untreated control for test
     compound A at a concentration of m ppm respectively m g/ha,

Y   is the efficacy expressed in % mortality of the untreated control for test compound
     B at a concentration of n ppm respectively n g/ha,

E   is the efficacy expressed in % mortality of the untreated control using the mixture
     of A and B at m and n ppm respectively m and n g/ha,

then is $$E = X + Y - \frac{X * Y}{100}$$

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If the observed insecticidal efficacy of the combination is higher than the one calculated as "E," then the combination of the two compounds is more than additive, i.e., there is a synergistic effect.

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9. Example A: Myzus persicae – test

Solvent: 78 parts by weight of acetone
    1.5 parts by weight of dimethylformamide

Emulsifier: 0.5 parts by weight of alkylaryl polyglycolether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

Cabbage leaves (*Brassica oleracea*) which are heavily infested by the green peach aphid (*Myzus persicae*) are treated by being sprayed with the preparation of the active compound at the desired concentration.

After the specified period of time, the mortality in % is determined. 100 % means that all the aphids have been killed; 0 % means that none of the aphids have been killed.

According to the present application, in this test, *e.g.*, the following combinations listed in Tables A1 and A2 show synergistic effects in comparison to the single compounds:

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Table A1
Plant damaging insects

Myzus persicae – Test

Active Ingredient	**Concentration** in g/ha	**Efficacy** in % after 1^d	
1-1-4	4	0	
Ethiprole	4	0	
1-1-4 + Ethiprole (1:1) according to the invention	4 + 4	obs.* 40	cal.** 0

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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Table A2
Plant damaging insects

Myzus persicae – Test

Active Ingredient	Concentration in g/ha	Efficacy in % after 6^d	
I-1-54	4	80	
	0.8	20	
I-1-1	4	90	
	0.8	60	
	0.16	0	
I-1-24	4	0	
I-1-12	4	70	
	0.8	40	
Ethiprole	4	0	
	0.8	0	
Fipronil	0.16	0	
I-1-54 + Ethiprole (1:1) according to the invention	4 + 4	obs.* 100	cal.** 80
I-1-24 + Ethiprole (1:1) according to the invention	4 + 4	obs.* 60	cal.** 0
I-1-12 + Ethiprole (1:1) according to the invention	0.8 + 0.8	obs.* 60	cal.** 40
I-1-1 + Fipronil (1:1) according to the invention	0.16 + 0.16	obs.* 20	cal.** 0

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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10.   Example B: **Phaedon cochleariae – test**

Solvent: 78 parts by weight of acetone
             1.5 parts by weight of dimethylformamide

Emulsifier: 0.5 parts by weight of alkylaryl polyglycolether

To produce a suitable preparation of active compound, 1 part by weight of active

compound is mixed with the stated amount of solvent and emulsifier, and the concentrate

is diluted with emulsifier-containing water to the desired concentration.

Cabbage leaves (*Brassica oleracea*) are treated by being sprayed with the preparation of

the active compound at the desired concentration and are infested with larvae of the

mustard beetle (*Phaedon cochleariae*) as long as the leaves are still moist.

After the specified period of time, the mortality in % is determined. 100 % means that all

the beetle larvae have been killed; 0 % means that none of the beetle larvae have been

killed.

According to the present application, in this test, *e.g.*, the following combinations listed in

Tables B1 and B2 show synergistic effects in comparison to the single compounds:

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Table B1

Plant damaging insects
Phaedon cochleariae – test

Active Ingredient	Concentration in g/ha	Efficacy in % after 2^d	
I-1-52	0.16	33	
	0.032	0	
I-1-1	4	67	
	0.8	50	
I-1-24	4	50	
	0.8	17	
I-1-12	0.8	33	
	0.16	0	
I-1-4	4	67	
	0.8	33	
Ethiprole			
	0.8	50	
Fipronil	0.8	83	
	0.16	33	
I-1-24 + Ethiprole (1:1) according to the invention	0.8 + 0.8	obs.* **83**	cal.** **58.5**
I-1-12 + Ethiprole (1:1) according to the invention	0.8 + 0.8	obs.* **100**	cal.** **66.5**
I-1-4 + Ethiprole (1:1) according to the invention	0.8 + 0.8	obs.* **100**	cal.** **66.5**

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I-1-52 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	100	55.11
I-1-1 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.8 + 0.8	100	91.5
I-1-24 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.8 + 0.8	100	85.89
I-1-12 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	83	33

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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Table B2

Plant damaging insects
Phaedon cochleariae – test

Active Ingredient	Concentration in g/ha	Efficacy in % after 6^d	
I-1-54			
	0.16	67	
I-1-52	0.8	83	
	0.16	33	
I-1-1	0.8	50	
	0.032	0	
I-1-12	0.8	33	
	0.16	0	
I-1-4	0.8	33	
	0.16	0	
Ethiprole	0.8	67	
	0.16	33	
Fipronil			
	0.16	50	
I-1-54 + Ethiprole (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	100	77.89
I-1-52 + Ethiprole (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	83	55.11
I-1-1 + Ethiprole (1:1)		obs.*	cal.**
according to the invention	0.8 + 0.8	100	83.5

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I-1-12 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	83	50
I-1-4 + Fipronil (1:1)		obs.*	cal.**
according to the invention	0.16 + 0.16	67	50

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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11.   Example C: Spodoptera frugiperda – test

Solvent: 78 parts by weight of acetone
              1.5 parts by weight of dimethylformamide

Emulsifier: 0.5 parts by weight of alkylaryl polyglycolether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

Cabbage leaves (*Brassica oleracea*) are treated by being sprayed with the preparation of the active compound at the desired concentration and are infested with larvae of the fall army worm (*Spodoptera frugiperda*) as long as the leaves are still moist.

After the specified period of time, the mortality in % is determined. 100 % means that all the caterpillars have been killed; 0 % means that none of the caterpillars have been killed.

According to the present application, in this test, *e.g.*, the following combinations listed in Tables C1 and C2 show synergistic effects in comparison to the single compounds:

Table C1

Plant damaging insects
Spodoptera frugiperda – test

Active Ingredient	Concentration in g/ha	Efficacy in % after 2^d	
I-1-54	0.8	67	
	0.16	50	
	0.032	0	
I-1-4	0.8	50	
Ethiprole	0.8	0	
Fipronil	0.16	17	
I-1-54 + Ethiprole (1:1) according to the invention	**0.8 + 0.8**	obs.* 83	cal.** 67
I-1-4 + Ethiprole (1:1) according to the invention	**0.8 + 0.8**	obs.* 83	cal.** **50**
I-1-54 + Fipronil (1:1) according to the invention	**0.16 + 0.16**	obs.* 100	cal.** 58.5

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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Table C2

Plant damaging insects
Spodoptera frugiperda -- test

Active Ingredient	**Concentration** **in g/ha**	**Efficacy** **in % after 6^d**	
I-1-52	0.16 0.032	83 50	
I-1-24	0.032	50	
I-1-12	0.032	67	
Ethiprole	0.032	0	
Fipronil	0.16	17	
I-1-52 + Ethiprole (1:1) according to the invention	0.032 + 0.032	**obs.*** 100	**cal.*** 50
I-1-24 + Ethiprole (1:1) according to the invention	0.032 + 0.032	**obs.*** 100	**cal.*** 50
I-1-12 + Ethiprole (1:1) according to the invention	0.032 + 0.032	**obs.*** 100	**cal.*** 67
I-1-52 + Fipronil (1:1) according to the invention	0.16 + 0.16	**obs.*** 100	**cal.*** 85.89
I-1-12 + Fipronil (1:1) according to the invention	0.032 + 0.032	**obs.*** 100	**cal.*** 72.61

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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12.   Example D: **Tetranychus test** (OP-resistant/dip test)

Solvent: 78 parts by weight of acetone
              1.5 parts by weight of dimethylformamide

Emulsifier: 0.5 parts by weight of alkylaryl polyglykolether

To produce a suitable preparation of active compound, 1 part by weight of active

compound is mixed with the stated amount of solvent and emulsifier, and the concentrate

is diluted with emulsifier-containing water to the desired concentration.

Bean plants (*Phaseolus vulgaris*) which are heavily infested with all stages of the two-

spotted spider mite (*Tetranychus urticae*) are treated by being sprayed with the preparation

of the active compound at the desired concentration.

After the specified period of time, mortality in % is determined. 100 % means that all the

spider mites have been killed; 0 % means that none of the spider mites have been killed.

According to the present application, in this test, *e.g.*, the following combination listed in

Table D1 shows a synergistic effect in comparison to the single compounds:

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Table D1
Plant damaging mites

Tetranychus urticae (OP-resistant) – Test

Active Ingredient	Concentration in g/ha	Efficacy in % after 6^d	
I-1-24	4	0	
	0.16	0	
Ethiprole	4	0	
I-1-24 + Ethiprole (1:1) according to the invention		obs.*	cal.**
	4 + 4	50	0

* obs. = observed insecticidal efficacy
** cal. = efficacy calculated with Colby-formula

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13. The undersigned declarant declares further that all statements made herein of her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at Monheim, Germany,

_1.6.2011_
Date

Maike H.
NAME

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